

WHAT IS CLAIMED IS:

1. A method for manufacturing carbon fiber,  
comprising :

5 a step of forming a coated film containing a  
metal organic compound and a water-soluble polymer  
compound by applying an ink for producing a catalyst  
comprising a solution containing at least the metal  
organic compound and the polymer compound onto a  
substrate,

10 a step of forming catalyst particles  
comprising a metal constituting said metal organic  
compound by heating said coated film, and

a step of forming carbon fibers by bringing a  
gas containing carbon into contact with the catalyst  
15 particles.

2. The method according to claim 1, wherein  
said polymer compound is any one selected from the  
group consisting of polyvinyl alcohol, polyacrylic  
20 acids and polyvinylpyrrolidone.

3. The method according to claim 1, wherein  
said metal constituting the metal organic compound is  
any one selected from the group consisting of Pd, Fe,  
25 Co and Ni.

4. The method according to claim 1, wherein

said metal organic compound is a metal organic complex.

5           5. The method according to claim 1, wherein  
a main solvent of said catalyst-manufacturing ink is water.

10           6. The method according to claim 1, wherein  
a main solvent of said catalyst-manufacturing ink is an organic solvent.

15           7. The method according to claim 1, wherein  
the step of heating said coated film is carried out in a non-oxidizing atmosphere.

20           8. The method according to claim 1, wherein  
the step of heating said coated film is a step of baking the coated film in an oxidizing atmosphere and then heating it in a reducing atmosphere.

            9. The method according to claim 1, wherein  
said gas containing carbon is a hydrocarbon gas.

25           10. The method according to claim 1, wherein  
said gas containing carbon is a mixed gas of a hydrocarbon gas with hydrogen gas.

11. A method for manufacturing an electron emitting device containing carbon fibers connected to an electrode comprising at least:

5 a step of forming a coated film containing a metal organic compound and a water-soluble polymer compound by applying an ink for producing a catalyst comprising a solution containing at least the metal organic compound and the water-soluble polymer compound onto the electrode,

10 a step of forming catalyst particles comprising a metal constituting said metal organic compound on said electrode by heating said coated film, and

15 a step of forming carbon fibers by bringing a gas containing carbon into contact with the catalyst particles.

12. The method according to claim 11, wherein said polymer compound is any one selected from the group consisting of polyvinyl alcohol, 20 polyacrylic acids and polyvinylpyrrolidone.

13. The method according to claim 11, wherein said metal constituting the metal organic 25 compound is any one selected from the group consisting of Pd, Fe, Co and Ni.

14. The method according to claim 11,  
wherein said metal organic compound is a metal  
organic complex.

5           15. The method according to claim 11,  
wherein said gas containing carbon is a mixed gas of  
a hydrocarbon gas with hydrogen gas.

10           16. An ink for producing a catalyst for  
growing carbon fibers, comprising at least a metal  
organic compound, a water-soluble polymer compound  
and a solvent.

15           17. The catalyst-manufacturing ink according  
to claim 16, wherein said polymer compound is any one  
selected from the group consisting of polyvinyl  
alcohol, polyacrylic acids and polyvinylpyrrolidone.

20           18. The catalyst-manufacturing ink according  
to claim 16, wherein said metal constituting the  
metal organic compound is any one selected from the  
group consisting of Pd, Fe, Co, and Ni.

25           19. The catalyst-manufacturing ink according  
to claim 16, wherein said metal organic compound is a  
metal organic complex.

20. The catalyst-manufacturing ink according to claim 16, wherein said solvent is mainly water.

21. The catalyst-manufacturing ink according to claim 16, wherein said solvent is mainly an organic solvent.

22. A method for manufacturing a display using a plurality of electron emitting devices, wherein said electron emitting devices are manufactured by the method according to claim 11.